

CIVIL AERONAUTICS BOARD

ACCIDENT INVESTIGATION REPORT

Adopted October 18, 1949

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ALL AMERICAN AIRWAYS, INC., CLARKSBURG, W. VA., MAY 11, 1949

The Accident

All American Airways' Trip 1, a Stinson 10RC, NC-18488, crashed and burned following a takeoff from Benedum Airport, Clarksburg, W. Va., at approximately 0732, * May 11, 1949. The aircraft was destroyed and both occupants were killed.

History of the Flight

At approximately 0630 Trip 1 departed from Pittsburgh, Pa., for Huntington, W. Va., on an air mail pickup flight under Visual Flight Rules. The crew consisted of Captain William Bruce Burkhart and Flight Mechanic William John Steinbrenner. Mail was picked up and dropped while in flight at several stations en route, however, because of the nature of the cargo to be discharged at Clarksburg, W. Va., the aircraft was landed there. The cargo destined for Clarksburg was unloaded without stopping the engine and the Captain remained in the pilot's seat. No cargo was taken on board and the gross weight of the aircraft upon departure from Clarksburg was 3,982 pounds, which was 168 pounds less than the maximum allowable of 4,150 pounds and the cargo was properly distributed.

NC-18488 was then taxied to the end of the 3,800-foot long Runway 5. The flight remained at the end of the runway for sufficient time to accomplish a pre-takeoff engine check, however, it is not known whether an engine run-up was in fact made. The aircraft was turned onto the runway and the takeoff run started at about 0730. It proceeded down the runway a distance of approximately 2,500 feet and, shortly after becoming airborne, a shallow climbing turn to the right was started. This turn continued toward rising terrain and the aircraft had climbed to approximately 200 feet when the turn

was observed to steepen to approximately 45 degrees. Following this the pilot lost control of the aircraft and it crashed in a near vertical attitude. Fire which followed the impact destroyed the aircraft.

Investigation

The aircraft crashed on the side of a small hill, located on a bearing of 110 degrees and approximately 1,900 feet east of the northeast end of Runway 5 and at an elevation of about 100 feet above the runway. Ground marks and scarred tree trunks showed that the aircraft struck at a near vertical angle and turned in a clockwise direction approximately 100 degrees. The fire which followed consumed all of the inflammable parts of the aircraft.

The engine had been displaced rearward into the cabin by impact, causing extensive damage. All instruments were badly damaged and could not be read. Cockpit controls, positions of which could be determined, were found as follows: throttle open, carburetor mixture full rich and carburetor heat off. The fuel control valve was found in the off position, with its selector valve handle missing. A pressure type fire extinguisher had not been discharged and its safety pin was in place. The mail pickup arm was retracted as were the wing flaps.

Though subjected to intense heat the airframe remained virtually intact. Control cables and pulleys were found in their proper locations, although several pulleys were damaged by fire. All control surfaces operated through their full travel distances. The adjustable horizontal stabilizer was in the neutral position. Examination indicated that all controls were capable of normal operation.

The left side of the landing gear, including strut, axle and wheel, remained attached to the fuselage and the right

* All times referred to herein are Eastern Standard and based on the 24-hour clock

side, although detached, was found nearby. The constant speed propeller was found attached to the crankshaft and was extensively damaged. The propeller governor was examined and its control shaft and speeder spring adjusting rack were engaged at the fourth serration from the top of the rack. A test to determine the engine r.p.m. which the aforementioned governor setting represented was made using an identical governor with its control shaft and speeder spring adjusting rack engaged in the same position as those of the damaged governor. This indicated that the propeller governor as found at the scene of the accident was set at 2,000 r.p.m.

Several cylinders were broken from the power section. The accessory section, nose case, rocker box covers and most of the alloy parts were destroyed by the fire. All articulating rods, piston pins, knuckle pins, etc., were intact and all valves and rocker arms were accounted for. The rear cheek of the crankshaft was displaced one-fourth inch in the direction of rotation. Evidence disclosed that appreciable engine power was being produced at the time of the accident.

Following the examination of the wreckage tests were made to determine the elapsed time between the closing of the fuel valve and the resultant power failure due to fuel starvation. These tests were conducted at Pittsburgh using an identical All American Airways' Stinson. Various power settings were used to simulate flying conditions. With a propeller setting of 2,240 r.p.m. and a manifold pressure of 26 1/2 inches, normal takeoff settings, the engine stopped eleven seconds after the fuel valve was closed. Sixteen seconds elapsed before the engine stopped when simulating cruise conditions which normally call for 2,000 r.p.m. Approximately two minutes had elapsed after the aircraft had taken off and the accident occurred. A thorough investigation failed to reveal any mechanical or structural failure prior to impact with the ground.

Some pilot complaints had been filed regarding the flight characteristics of NC-18488. However, in each instance these irregularities had been rectified and on subsequent flights pilots stated that the aircraft had flown in a normal manner. Examination of the company's maintenance and operation records disclosed that the aircraft had been

satisfactorily maintained and was air-worthy on the day of the accident.

The Clarksburg Airport is located in hilly country. In a general easterly direction from the northeast end of Runway 5 are several small hills with their highest point rising 273 feet above the runway. Slightly to the left of the takeoff direction from Runway 5 lies a valley which for two miles has no obstruction higher than fifty feet above the airport. The company's Operational Manual requires that a left turn or a straight course be made when taking off from Runway 5. No deviation from this procedure (except in the case of emergency) is permitted without requesting and receiving waiver from the Civil Aeronautics Administration. Such a waiver had not been requested.

Witnesses stated that during and after the takeoff they did not hear the characteristic engine noise which is normally heard when the propeller is set in the low pitch position. They also stated that NC-18488 took a longer than normal takeoff run before becoming airborne and that the engine did not sound as if it was developing full takeoff power.

At the time of the accident there were high broken clouds, an estimated ceiling at 5,000 feet and haze and smoke with a visibility of five miles. The temperature was 42° F and dew point 30° F. and the wind was from the north at eight miles per hour.

Captain Burkhart had flown over the route, which included Clarksburg, many times and was thoroughly familiar with the terrain.

Analysis

When the fuel valve was found in the closed position it was thought that perhaps the aircraft had taken off with this valve closed, had exhausted what fuel remained in the system and then crashed due to fuel starvation. However, tests which were made under simulated flight conditions proved conclusively that due to the time element involved this could not have been the case. Since the engine was developing appreciable power at the time of impact, it is concluded that the position of the fuel valve was changed as a result of impact forces.

Following takeoff, the aircraft made a right turn which was contrary to the company's rules and CAA requirements. That these rules are necessary is borne out by

the statements of other pilots, that a right turn after takeoff from this runway would be extremely hazardous because the flight path would be toward rapidly rising terrain. However, the pilot elected to make such a turn whereas a turn to the left or a straight course ahead would have been both proper and safe.

Although examination of the propeller governing mechanism indicated a propeller setting of 2,000 r.p.m., it is possible that this setting might have been changed by the impact. However, 2,000 r.p.m. is the setting normally used for both cruising speed and mail pickups on the Stinson SR-10-C and from a study of all the evidence available in the investigation it appears that the pilot neglected to change the propeller setting to the low pitch (takeoff) position prior to the takeoff. Climb performance of the aircraft with the propeller set at cruise r.p.m. would be reduced from that value which would have been obtained if the propeller were set in the takeoff position.

The weather is not considered a contributing factor to this accident.

Findings

1. The carrier, the aircraft and the crew were properly certificated.
2. Immediately after takeoff a right turn was made toward rising terrain, contrary to safe operating procedures.

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3. The turn was steepened to approximately a 45° bank to avoid higher terrain following which the pilot lost control and the aircraft crashed in a near vertical attitude.

4. The takeoff was made with the propeller control setting in the cruise position and the propeller governor was found to be set at 2,000 r.p.m.

5. At 2,000 r.p.m. setting the engine was not producing rated takeoff power.

6. There was no evidence of structural or mechanical failure to the aircraft or engine prior to impact.

7. Examination of the engine revealed that it was receiving fuel until impact with the ground.

8. The aircraft crashed at a point approximately 1,900 feet east of Runway 5.

Probable Cause

The Board determines that the probable cause of this accident was the pilot's action in making a takeoff with the propeller set in the cruise position, which precipitated a stall and loss of control of the aircraft while executing a steep right turn to avoid high terrain.

BY THE CIVIL AERONAUTICS BOARD

/s/ JOSEPH J O'CONNELL, JR.
 /s/ OSWALD RYAN
 /s/ JOSH LEE
 /s/ HAROLD A JONES
 /s/ RUSSELL B ADAMS

Supplemental Data

Investigation and Hearing

The Civil Aeronautics Board was notified of the accident on May 11, 1949, by the Civil Aeronautics Administration, and an investigation was immediately initiated in accordance with the provisions of Section 702 (a) (2) of the Civil Aeronautics Act of 1938, as amended. A public hearing was held in Clarksburg, W. Va., June 16, 1949.

Air Carrier

All American Airways, Inc., was incorporated under the laws of the State of Delaware, and held a certificate of public convenience and necessity authorizing the carriage of mail and property and an airmail pickup service. This certificate was issued July 22, 1940 and permitted operations in the area of Pittsburgh, Pa., and five adjacent states.

Flight Personnel

Pilot William Bruce Burkhart held an airman's certificate with an airline

transport rating. He had been employed by the company since 1939 and had accumulated a total of 3,058 flying hours. His last CAA physical examination was on March 10, 1949. William John Steinbrenner, flight mechanic, was employed by All American Airways on May 1, 1946. He held a currently effective A&E license.

The Aircraft

NC-18488 was a single engine high wing Stinson, model SR-10-C aircraft manufactured in 1938. The aircraft was currently certificated by the Civil Aeronautics Administration. It had a total of 11,200 flying hours at the time of the accident. The engine, a Lycoming R680-D5, two-hundred and sixty horsepower had a total of 194 34 since overhaul. It was equipped with a Hamilton Standard constant speed propeller.